SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Two unbiased dice are thrown. Find the probability that:

(a) Both the dice show same number

(b) First die shows 6

(c) The total of the numbers on the dice is 8.

17. If the masses of 300 students are normally distributed with mean 68 kgs and standard deviation 3kgs. How many students have masses?

(a) Greater than 72kgs.

(b) Less than or equal to 64 kgs

(c) Between 65 and 71 kgs inclusive.

18. Examine the methods of constructing the Index Numbers.

19. Two sample polls of votes for two candidates A and B are taken. The results are given below. Examine the nature of the area is related to voting preference or not.

Vote for Area	A	B	Total
Rural	620	380	1000
Urban	550	450	1000
Total	1170	830	2000

20. Examine the basic principles of Experimental Designs.

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NOVEMBER/DECEMBER 2024

23UECA22A — STATISTICAL METHODS AND ITS APPLICATIONS - II

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is called an Equally Likely Events? Give an example.

2. Differentiate between sample space sample points.

3. Comment on the following: The mean of a binomial distribution is 3 and variance is 4.

4. What is meant by Poisson distribution?

5. Define an Index Number.

6. What is factor reversal test?

7. Define: Small Samples.

8. Write down the applications of Chi — Square Distribution.

9. What is the principle of analysis of variance?

10. State the principle of randomization in experimental design.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Prove that the Addition Theorem of Probability.

Or

(b) A box Contains 6 red, 4 white and 5 black balls. A person draws 4 balls from the box at random. Find the probability that among the balls drawn there is at least one ball of each Colour.

12. (a) Fit a Binomial distribution for the following data.

x	0	1	2	3	4	5
f	2	14	20	34	22	8

Or

(b) A car hire firm has 2 cars which it hires out day by day. The number of demands for a car on each day is distributed as Poisson with mean 1.5 Calculate the proportion of days

(i) on which there is no demand

(ii) on which demand is refused.

13. (a) Narrate the uses of index numbers.

Or

(b) Calculate the price index and quantity index for the following data by Fisher's ideal formula and verify that it satisfies the factor reversal test.

Commodity	Base Year		Current Year	
	Price (Rs.)	Quantity ('000 tonnes)	Price (Rs.)	Quantity ('000 tonnes)
A	40	70	40	32
B	50	84	30	80
C	60	58	25	50

14. (a) Discuss on Chi-Square test for independence of attributes.

Or

(b) Acme Toy Company prints baseball cards. The company claims that 30% of the cards are rookies, 60% veterans and 10% are All-Stars. Suppose a random sample of 100 cards has 50 rookies, 45 veterans, and 5 All-Stars. Is this consistent with Acme's claim? Use a 0.05 level of significance.

15. (a) Explicate the analysis and assumptions of Two-Way ANOVA.

Or

(b) Elaborate the Latin Square Design.